LC550EUD

Product Specification

CONTENTS

Ver.1.0

LC550EUD

Product Specification

RECORD OF REVISIONS

| Revision No.	Revision Date	Page	Description
0.0	Jan. 18, 2011	-	Preliminary Specification
1.0	Feb. 14. 2011	-	Final Specification

Product Specification

1. General Description

The LC550EUD is a Color Active Matrix Liquid Crystal Display with an integral Light Emitting Diode (LED) backlight system. The matrix employs a-Si Thin Film Transistor as the active element. It is a transmissive display type which is operating in the normally black mode. It has a 46.96 inch diagonally measured active display area with WUXGA resolution (1080 vertical by 1920 horizontal pixel array). Each pixel is divided into Red, Green and Blue sub-pixels or dots which are arrayed in vertical stripes. Gray scale or the luminance of the sub-pixel color is determined with a 10-bit gray scale signal for each dot. Therefore, it can present a palette of more than 1.06Bilion colors.
It has been designed to apply the 10-bit 4-port LVDS interface.
It is intended to support LCD TV, PCTV where high brightness, super wide viewing angle, high color gamut, high color depth and fast response time are important.
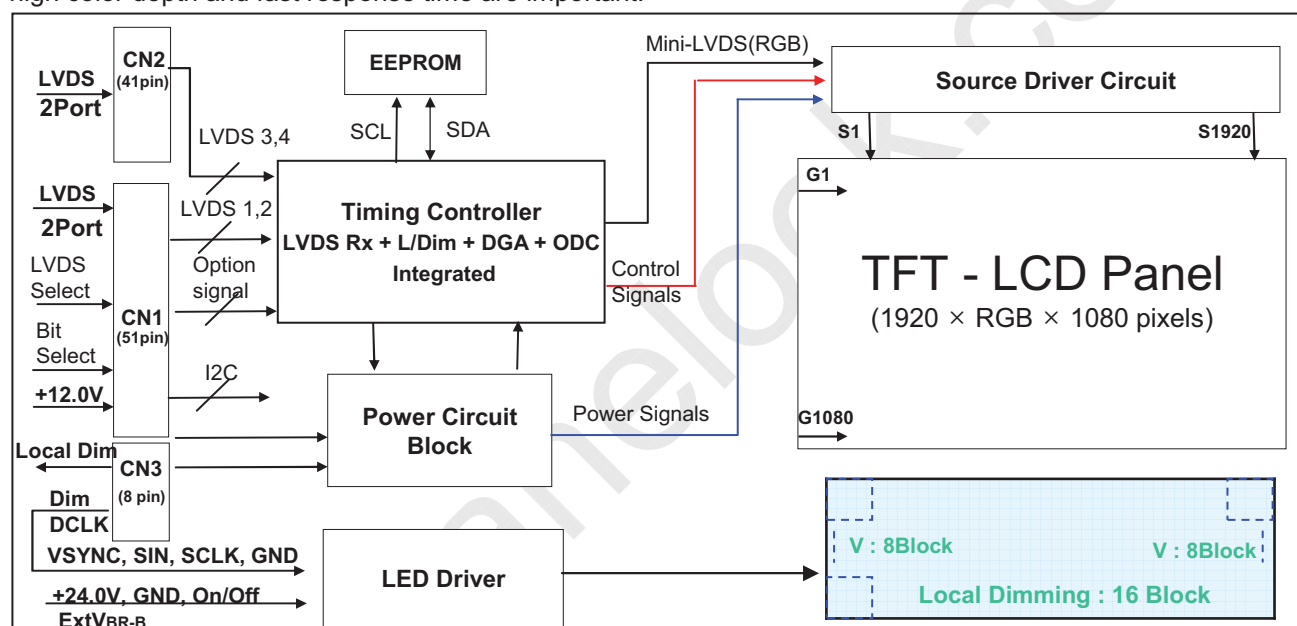
General Features

Active Screen Size	54.64 inch (1387.80mm) diagonal
Outline Dimension	1255.6(H) × 726.4(V) X 10.8(B) / 24 mm(D) (Typ.)
Pixel Pitch	0.630 mm x 0.630 mm x RGB
Pixel Format	1920 horiz. by 1080 vert. Pixels, RGB stripe arrangement
Color Depth	10Bit(D), 1.06 Billion colors
Luminance, White	450 cd/m2 (Center 1point ,Typ.)
Viewing Angle (CR>10)	Viewing angle free (R/L 178 (Min.), U/D 178 (Min.))
Power Consumption	Total 128.3W(Typ.) [Logic= 6.1W, Backlight=122.2W (ExtVbr_B=100%)] ,Scanning Off
Weight	14.5 Kg (Typ.)
Display Mode	Transmissive mode, Normally black
Surface Treatment	Hard coating(2H), Anti-glare treatment of the front polarizer (Haze 10%)

Product Specification

2. Absolute Maximum Ratings

The following items are maximum values which, if exceeded, may cause faulty operation or permanent damage to the LCD module.

Table 1. ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Value		Unit	Note
			Min	Max		
Power Input Voltage	LCD Circuit	V_{LCD}	-0.3	+14.0	V_{DC}	1
	Driver	V_{BL}	-0.3	+ 27.0	V_{DC}	
Driver Control Voltage	ON/OFF	V_{OFF} / V_{ON}	-0.3	+5.5	V_{DC}	
	Brightness	**EXTV**$_{BR-B}$	0.0	+5.5	V_{DC}	
T-Con Option Selection Voltage		V_{LOGIC}	-0.3	+4.0	V_{DC}	
Operating Temperature		T_{OP}	0	+50	°C	2,3
Storage Temperature		T_{ST}	-20	+60	°C	
Panel Front Temperature		T_{SUR}	-	+68	°C	4
Operating Ambient Humidity		H_{OP}	10	90	%RH	2,3
Storage Humidity		H_{ST}	10	90	%RH	

Note1. Ambient temperature condition (Ta = 25 ± 2 °C)
2. Temperature and relative humidity range are shown in the figure below.
  Wet bulb temperature should be Max 39°C, and no condensation of water.
3. Gravity mura can be guaranteed below 40°C condition.
4. The maximum operating temperatures is based on the test condition that the surface temperature of display area is less than or equal to 68°C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in final product design to prevent the surface temperature of display area from being over 68℃. The range of operating temperature may be degraded in case of improper thermal management in final product design.
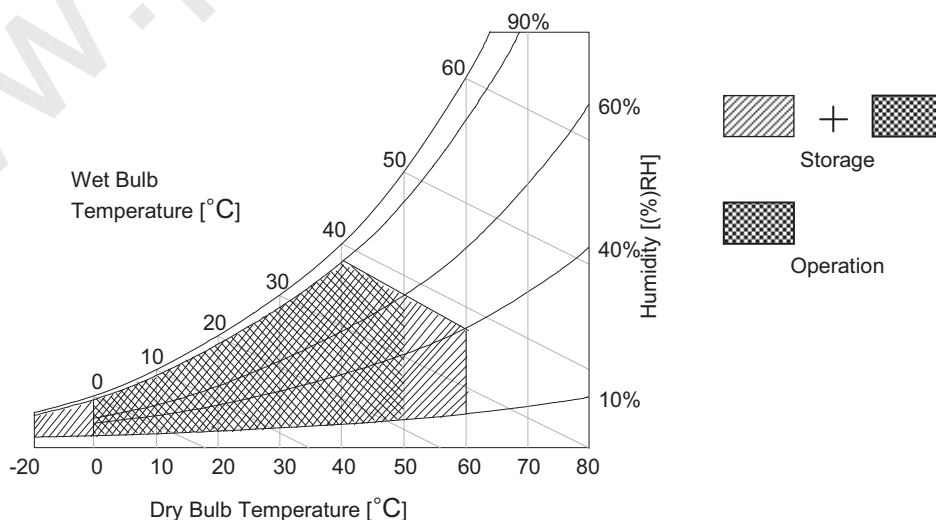
Product Specification

3. Electrical Specifications

3-1. Electrical Characteristics

It requires two power inputs. One is employed to power for the LCD circuit. The other Is used for the LED backlight and LED Driver circuit.
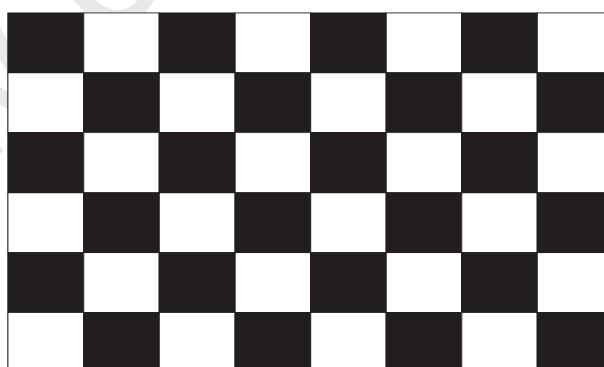
Table 2. ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Value			Unit	Note
		Min	Typ	Max		
Circuit :						
Power Input Voltage	V_{LCD}	10.8	12.0	13.2	V_{DC}	
Power Input Current	I_{LCD}	-	510	663	mA	1
		-	765	995	mA	2
Power Consumption	P_{LCD}	-	6.1	8.0	Watt	1
Rush current	I_{RUSH}	-	-	5.0	A	3

Note : 1. The specified current and power consumption are under the V_{LCD}=12.0V, $25 \pm 2°C$, f_V=120Hz condition whereas mosaic pattern(8 x 6) is displayed and f_V is the frame frequency.

2. The current is specified at maximum current pattern.

3. The duration of rush current is about 2ms and rising time of power input is 0.5ms (min.).

White : 1023 Gray
Black : 0 Gray

Mosaic Pattern(8 x 6)

LC550EUD

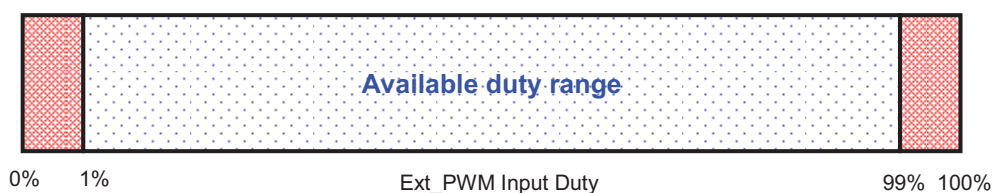## Product Specification

Table 3. ELECTRICAL CHARACTERISTICS (Continue)

Parameter			Symbol	Values			Unit	Notes
				Min	Typ	Max		
LED Driver :								
Power Supply Input Voltage			VBL	22.8	24.0	25.2	Vdc	1
Power Supply Input Current			IBL	-	5.1	5.6	A	Scanning Off , 1
				-	6.1	6.7	A	Scanning On , 1 (PWM On Duty)
Power Supply Input Current (In-Rush)			In-rush	-	-	8.4	A	V_{BL} = 22.8V Ext V_{BR-B} = 100%, 4
Power Consumption			PBL	-	122.2	133.6	W	Scanning Off , 1
					119.9	130.9	W	Scanning On , 1
Input Voltage for Control System Signals	On/Off	On	V on	2.5	-	5.0	Vdc	
		Off	V off	-0.3	0.0	0.7	Vdc	
	Brightness Adjust		ExtV_{BR-B}	1	-	100	%	On Duty , 6
	PWM Frequency for NTSC & PAL	PAL	PAL	97	100	103	Hz	3
		NTSC	NTSC	117	120	123	Hz	3
	Pulse Duty Level (PWM)	High Level	High Level	2.5	-	5.0	Vdc	HIGH : on duty LOW : off duty
		Low Level	Low Level	0.0	-	0.7	Vdc	
LED :								
Life Time				30,000	50,000		Hrs	2

Notes :

1. Electrical characteristics are determined after the unit has been 'ON' and stable for approximately 60 minutes at 25±2°C. The specified current and power consumption are under the typical supply Input voltage 24Vand V_{BR} (ExtV_{BR-B} : 100%), it is total power consumption.

2. The life time (MTTF) is determined as the time which luminance of the LED is 50% compared to that of initial value at the typical LED current (ExtVBR-B :100%) on condition of continuous operating in LCM state at 25±2°C.

3. LGD recommend that the PWM freq. is synchronized with One time harmonic of V_sync signal of system. Though PWM frequency is over 120Hz (max 252Hz), function of LED Driver is not affected.

4. The duration of rush current is about 200ms.

5. Even though inrush current is over the specified value, there is no problem if I^2T spec of fuse is satisfied.

6. Ext_PWM Signal have to input available duty range.
Between 99% and 100% ExtV_{BR-B} duty have to be avoided. (99% < ExtV_{BR-B} < 100%)
But ExtV_{BR-B} 0% and 100% is possible.

High

Available duty range

Low

0%   1%   Ext_PWM Input Duty   99% 100%

LC550EUD

Product Specification

3-2. Interface Connections

This LCD module employs two kinds of interface connection, 51-pin connector and 41-pin connector are used for the module electronics and 12-pin,13-pin connector is used for the integral backlight system.

3-2-1. LCD Module

- LCD Connector(CN1): FI-R51S-HF(manufactured by JAE)
         Refer to below and next Page table

Table 4-1. MODULE CONNECTOR(CN1) PIN CONFIGURATION

No	Symbol	Description	No	Symbol	Description
1	NC	No Connection	27	Bit Select	'H' or NC= 10bit(D) , 'L' = 8bit
2	NC	No Connection	28	R2AN	SECOND LVDS Receiver Signal (A-)
3	NC	No Connection	29	R2AP	SECOND LVDS Receiver Signal (A+)
4	SDA	SDA (For Local Dimming)	30	R2BN	SECOND LVDS Receiver Signal (B-)
5	SCL	SCL (For Local Dimming)	31	R2BP	SECOND LVDS Receiver Signal (B+)
6	NC	No Connection (Note 4)	32	R2CN	SECOND LVDS Receiver Signal (C-)
7	LVDS Select	'H' =JEIDA , 'L' or NC = VESA	33	R2CP	SECOND LVDS Receiver Signal (C+)
8	NC	No Connection (Note 4)	34	GND	Ground
9	NC	No Connection (Note 4)	35	R2CLKN	SECOND LVDS Receiver Clock Signal(-)
10	L-DIM Enable	'H' = Enable , 'L' or NC = Disable	36	R2CLKP	SECOND LVDS Receiver Clock Signal(+)
11	GND	Ground	37	GND	Ground
12	R1AN	FIRST LVDS Receiver Signal (A-)	38	R2DN	SECOND LVDS Receiver Signal (D-)
13	R1AP	FIRST LVDS Receiver Signal (A+)	39	R2DP	SECOND LVDS Receiver Signal (D+)
14	R1BN	FIRST LVDS Receiver Signal (B-)	40	R2EN	SECOND LVDS Receiver Signal (E-)
15	R1BP	FIRST LVDS Receiver Signal (B+)	41	R2EP	SECOND LVDS Receiver Signal (E+)
16	R1CN	FIRST LVDS Receiver Signal (C-)	42	NC	No Connection
17	R1CP	FIRST LVDS Receiver Signal (C+)	43	NC	No Connection
18	GND	Ground	44	GND	Ground
19	R1CLKN	FIRST LVDS Receiver Clock Signal(-)	45	GND	Ground
20	R1CLKP	FIRST LVDS Receiver Clock Signal(+)	46	GND	Ground
21	GND	Ground	47	NC	No connection
22	R1DN	FIRST LVDS Receiver Signal (D-)	48	VLCD	Power Supply +12.0V
23	R1DP	FIRST LVDS Receiver Signal (D+)	49	VLCD	Power Supply +12.0V
24	R1EN	FIRST LVDS Receiver Signal (E-)	50	VLCD	Power Supply +12.0V
25	R1EP	FIRST LVDS Receiver Signal (E+)	51	VLCD	Power Supply +12.0V
26	NC	No Connection	-	-	-

Note 1. All GND(ground) pins should be connected together to the LCD module's metal frame.
   2. All V$_{LCD}$ (power input) pins should be connected together.
   3. All Input levels of LVDS signals are based on the **EIA 644** Standard.
   4. #1~#6 & #8~#9 NC (No Connection): These pins are used only for LGD (Do not connect)
   5. Specific pins(pin No. **#10**) are used for Local Dimming function of the LCD module.
    If not used, these pins are no connection. (Please see the **Appendix V** for more information.)
   6. LVDS pin (pin No. **#24,25,40,41**) are used for 10Bit(D) of the LCD module.
    If used for 8Bit(R), these pins are no connection.
   7. Specific pin No. **#44** is used for "No signal detection" of system signal interface.
    It should be GND for NSB(No Signal Black) during the system interface signal is not.
    If this pin is "H", LCD Module displays AGP(Auto Generation Pattern).
   8. Specific pin (pin No. #4, #5) is used for Controlling Local Dimming's register in the LCM Module.